

CLAIMS

1. Method for controlling a device for measuring quantitative proportions of blood constituents, in which electromagnetic radiation of different radiation frequencies is passed through a blood-containing vessel, and at least a portion of the radiation exiting the vessel is detected by sensors and fed to an evaluating device, characterized by the fact that at least two radiation detection sensors (2, 3, 4) are positioned a certain distance apart and that the evaluating device is assigned a calibration characteristic curve, which is determined by an individual calibration measurement, in which at least one constant is used as the calibration criterion and is determined from at least one measurement variable (22) detected by the sensors (2, 3, 4).

2. Method in accordance with Claim 1, characterized by the fact that at least three sensors (2, 3, 4) are used.

3. Method in accordance with Claim 1 or Claim 2, characterized by the fact that the measuring determination is performed in a multiplex operation.

4. Method in accordance with any of Claims 1 to 3, characterized by the fact that electromagnetic radiation in the optical frequency range is used.

5. Method in accordance with any of Claims 1 to 4, characterized by the fact that pulse spectroscopy is used for the measuring determination.

6. Method in accordance with any of Claims 1 to 4, characterized by the fact that spectrophotometry is used for the measuring determination.

7. Method in accordance with any of Claims 1 to 6, characterized by the fact that the spatial scattering of the radiation is determined by measurement technology.

8. Method in accordance with any of Claims 1 to 7, characterized by the fact that the scattering is determined by determining a radiation intensity that deviates from the primary irradiation direction.

9. Method in accordance with any of Claims 1 to 8, characterized by the fact that a periodic calibration is carried out during the performance of the measurement.

10. Method in accordance with any of Claims 1 to 9, characterized by the fact that the scattering is determined by the relationship between the amplitudes of the measured values of the individual sensors (2, 3, 4).

11. Method in accordance with any of Claims 1 to 10, characterized by the fact that an oxygen concentration of the blood is determined.

12. Method in accordance with any of Claims 1 to 11, characterized by the fact that a relative oxygen concentration of the blood is determined.

13. Method in accordance with any of Claims 1 to 11, characterized by the fact that an absolute oxygen concentration of the blood is determined.

14. Device for measuring quantitative proportions of blood constituents, which has at least one emission source for generating electromagnetic radiation and at least one sensor, which detects the transmitted portion of the radiation and is connected with an evaluating device, characterized by the fact that the evaluating device (10) has at least two sensors (2, 3,

4) and that the evaluating device (10) has an analyzer (11) for determining the angle-dependent scattering of the radiation by evaluating the signals received from the individual sensors (2, 3, 4).

15. Device in accordance with Claim 14, characterized by the fact that at least three sensors (2, 3, 4) are connected to the evaluating device (10).

16. Device in accordance with Claim 14 or Claim 15, characterized by the fact that at least two emission sources (5, 6, 7) are used.

17. Device in accordance with Claim 14 or Claim 15, characterized by the fact that at least three emission sources (5, 6, 7) are used.

18. Device in accordance with any of Claims 14 to 17, characterized by the fact that at least one of the emission sources (5, 6, 7) is designed as a light-emitting diode.

19. Device in accordance with any of Claims 14 to 17, characterized by the fact that at least one of the emission sources (5, 6, 7) is designed as a laser diode.

20. Device in accordance with any of Claims 14 to 19, characterized by the fact that at least one of the sensors (2, 3, 4) is designed as a photodiode.

21. Device in accordance with any of Claims 14 to 20, characterized by the fact that the sensors (2, 3, 4) are spaced essentially equal distances apart relative to one another.

Figure 4.

KEY:

Extinktionskoeffizienten von Hb, HbO₂, HbCO = absorptivities of

Hb, HbO₂, HbCO

Wellenlänge [nm] = wavelength [nm]

Figure 11.

KEY: Referenzmessung = reference measurement